

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

- 1 1. (Previously Presented) A method of forming a microcrystalline thin film, comprising:  
2 supplying, during a first process,  $\text{SiH}_4$  and  $\text{H}_2$  to a chamber in which a substrate is  
3 located;  
4 supplying, during a second process,  $\text{H}_2$  but not  $\text{SiH}_4$  to the chamber;  
5 depositing a portion of the microcrystalline thin film during the second process; and  
6 performing the first process and second process a plurality of times to form the  
7 microcrystalline thin film having a target film thickness on the substrate.
- 1 2. (Cancelled)
- 1 3. (Previously Presented) The method of claim 1, wherein performing the first process and  
2 second process a plurality of times is performed without removing the substrate from the  
3 chamber.
- 1 4. (Original) The method of claim 3, further comprising applying an electric field in the  
2 chamber to break down the  $\text{SiH}_4$  to  $\text{SiH}_2$ .
- 1 5. (Previously Presented) The method of claim 4, wherein supplying the  $\text{H}_2$  comprises  
2 supplying the  $\text{H}_2$  at a generally constant rate.
- 1 6. (Original) The method of claim 4, further comprising depositing the  $\text{SiH}_2$  to a surface of  
2 the substrate during the second process.
- 1 7. (Previously Presented) The method of claim 1, further comprising:  
2 converting  $\text{SiH}_4$  to  $\text{SiH}_2$ ; and  
3 depositing  $\text{SiH}_2$  on the substrate during the second process.

1 8. (Previously Presented) The method of claim 7, wherein depositing  $\text{SiH}_2$  on the substrate  
2 during the second process without supplying  $\text{SiH}_4$  reduces formation of a polymer due to  $\text{SiH}_2$   
3 molecules encountering each other prior to depositing of  $\text{SiH}_2$  on the substrate.

1 9. (Cancelled)

1 10. (Currently Amended) The method of claim ~~[[9]]~~ 28, wherein bonding of  $\text{SiH}_2$  is  
2 suppressed in the source depositing process.

1 11. (Cancelled)

1 12. (Currently Amended) The method of claim ~~[[11]]~~ 28, wherein  $\text{H}_2$  is supplied at a  
2 constant flow rate throughout said source supplying process and said source depositing process.

1 13. (Currently Amended) The method of claim ~~[[11]]~~ 28, wherein a flow rate ratio,  $r$ , of  $\text{SiH}_4$   
2 and  $\text{H}_2$  satisfies  $r \geq - (7/12) \times P + 72.5$ , where  $P$  is an electric field intensity density irradiated on  
3  $\text{SiH}_4$  and  $\text{H}_2$ .

1 14. (Currently Amended) The method of claim ~~[[9]]~~ 28, wherein performing said source  
2 supplying process comprises performing the source supplying process for 2 seconds or less, and  
3 performing said source depositing process comprises performing said source depositing process  
4 for longer than said source supplying process.

1 15.-16. (Cancelled)

1 17. (Currently Amended) A method of manufacturing a thin film transistor comprising:  
2 forming a gate electrode on the substrate;  
3 forming an insulation layer film on said substrate and said gate electrode,  
4 forming at least a portion of a channel layer film on said insulation layer by using the  
5 microcrystalline thin film forming method of claim [[9]] 28; and  
6 forming a source/drain electrode on said channel layer.

1 18. (Previously Presented) The method of manufacturing a thin film transistor of claim 17,  
2 wherein forming the channel layer film comprises forming the microcrystalline thin film up to 1  
3 nm away into the channel layer film from the interface with said insulation layer.

1 19.-25. (Cancelled)

1 26. (Previously Presented) The method of claim 1, wherein supplying  $\text{SiH}_4$  and  $\text{H}_2$  during  
2 the first process comprises supplying  $\text{SiH}_4$  at a first rate and  $\text{H}_2$  at a second rate, the first rate and  
3 second rate defining a flow rate ratio that prevents a thin film formed on the substrate from  
4 becoming amorphous.

1 27. (Previously Presented) The method of claim 26, further comprising applying an electric  
2 field during the first process, the electric field set at an intensity that in combination with the  
3 flow rate ratio prevents a thin film formed on the substrate from becoming amorphous.

1 28. (Currently Amended) ~~The method of claim 9, further comprising~~ A method of forming a  
2 microcrystalline thin film by activating SiH<sub>4</sub>, and forming a film having a microcrystalline  
3 structure on a film forming target object, wherein activating SiH<sub>4</sub> comprises applying an electric  
4 field to break down SiH<sub>4</sub> to SiH<sub>2</sub>, the method further comprising:

5 performing a source supplying process in which SiH<sub>4</sub> is supplied,

6 performing a source depositing process in which the supply of SiH<sub>4</sub> is stopped and SiH<sub>2</sub>  
7 is deposited on the film forming target object to form the microcrystalline structure, and

8 supplying H<sub>2</sub> during the source supplying process and during the source depositing  
9 process, SiH<sub>4</sub> and H<sub>2</sub> being supplied at flow rates during the source supplying process to prevent  
10 a film formed on the film forming target object from becoming amorphous.

1 29. (Currently Amended) A method of forming a microcrystalline thin film, comprising:  
2 supplying, during a source supplying process, SiH<sub>4</sub> and H<sub>2</sub> to a chamber in which a  
3 substrate is located, wherein formation of a layer of an amorphous film is prevented during the  
4 source supplying process; and

5 depositing the microcrystalline thin film on the substrate, wherein prior to depositing the  
6 microcrystalline thin film, the supplying of SiH<sub>4</sub> to the chamber is stopped.

1 30. (Currently Amended) The method of claim 29, further comprising:

2 applying an electric field in the chamber during the source supplying process to break  
3 down SiH<sub>4</sub> to SiH<sub>2</sub> molecules,

4 wherein depositing the microcrystalline thin film is performed during a source depositing  
5 process, and wherein forms a majority of the SiH<sub>2</sub> molecules is adsorbed on the substrate during  
6 the source depositing process to deposit the microcrystalline thin film on the substrate.

- 1 31. (Currently Amended) ~~The method of claim 29~~ A method of forming a microcrystalline  
2 thin film, comprising:  
3 supplying SiH<sub>4</sub> and H<sub>2</sub> to a chamber in which a substrate is located; and  
4 depositing the microcrystalline thin film on the substrate, wherein prior to depositing the  
5 microcrystalline thin film, the supplying of SiH<sub>4</sub> to the chamber is stopped,  
6 wherein supplying SiH<sub>4</sub> and H<sub>2</sub> ~~during the first process~~ comprises supplying SiH<sub>4</sub> at a  
7 first rate and H<sub>2</sub> at a second rate, the first rate and second rate defining a flow rate ratio that  
8 prevents a thin film formed on the substrate from becoming amorphous.